EFOLUTION OF THIS BUNTING IN OUR

First Fing of an American Admiral was Raised by Hopkins in 1775-Changes in Design and Positions in Flying It-Dewey the Emblem Farragut Loved. The Admiral's fing has been revived for Admiral Dewey, and it is of interest to know something about its beginning and its evolution in the service of our country. It has been generally believed that Farragut was the first officer in the United States navy to win the Litle of Admiral, but such is not the fact. The rank was ninetyone years older in the record of the service. On December 22, 1775, the Continental Congress commissioned Esck Hopkins, an old and experienced seaman, Commander-in-Chief of the navy, and George Washington officially addressed him as "Admiral Hop-

In the following year Admiral Hopkins put to sea from Philadelphia with his squadron of four ships and three sloops, and the Alfred, the flagship, carried Hopkins's flag. It was a square yellow still affair, bearing the pine tree, the rattle-annke in the act of striking, and the favorite motto, "Don't Tread On Me." This flag was sent aloft by Lieut. John Paul Jones. The insignta of flag rank was really more akin to the colonial flags than to any pr vious symbol of naval dignity, and was merely a personal fancy of Hopkins's for the righteouspess of his cause. Just how long this flag remained in the service is questionable, but as no one succeeded Hopkins in the solitary dignity of Commander in-Chief, it is highly probable that the flag went with him when he left the navy in

The union tack of the British ensign had long before become the recognized insignia of flag rank in the King's navy-being carried at the main, the fore, or the mizzenmast, accordingly as the squadron commander was an admiral, a vice-admiral, or a rear-admiral, and with the statutory adoption of our national ensign on June 14, 1777, we had something other than personal ch osing upon which to base our own m rkings of naval seniority. That resolution declared "that the flag of the thirteen United States be thirteen stripes, alternate red and white; that the union be thirteen stars, white, in a blue field, representing a new constellation."

That act at once gave us a blue flag, with thirteen stars, to be carried by our flag officers, but the democratic spirit of the Americans was too strong for a repetition of so aristocratic sounding a title as Admiral. The ranking officers of the service were captains, and, agreeably to contipental practice, the senior captain present could carry only a simple triangular pen-nant. Custom is pretty strong, even though set by your enemy, and in the shape of our flag we followed the example of the British, while we gave to our captains commanding squadrons the temporary title of Commo-dore. Up at their main trucks, these commodores hoisted their blue triangular flags not rightly the Commodore's swallow-tail of European navies—with their single big white star encircled by a ring of twelve

In 1818, with the presence of twenty-one states in the Union, the old formation of a single large star, surrounded by its circle of smaller ones, made it difficult to keep the flag within reasonable limits and still preserve the circlet of fair-sized stars, and, con-sequently, in 1887, when the Union had doubled its original strength, the stars were re-In 1844, however, though there were still but twenty-six states in the Union, the broad pennant was changed to the legiti-mate burgee or swallow-tall of a Commedore. That was significant that the Commodore, even though the rank was only a brevet, in-tended to assume all of the privileges that he knew he ought to have, even while Congress had failed to make his title a legal one. Long before this, the custom had become set to dis-tinguish between officers of the same rank carrying broad pennaus. The sentor com-modore carried a blue flag with white stars, the next commodore junior to him carried a red flag with white stars; while, should a third be present junior to both of the others. his flag, for the time, became white with stars. When apart on their separate navy-yard, under Commodore Chauncey; the red on board the Potomac, Commodore Downes; and the latter on board the Hudson, dore Cassin, just returned from the

In 1857, the title of flag-officer was legally in 1807, the title of hag-omeer was legally introduced in our service. Congress directing that "Captaius in command of squadrons" should be styled "flag officers"; and Preble says: "Officers so appointed, for want of regulation on the subject, continued to wear the broad pennant of a Commodore, or holwied the square flag of an Admiral, as they deemed proper."

The lack of harmony among the flags car-ried by flag-officers led Secretary Isaac Tou-cey in 1858 to prescribe: "It is hereby or-dered that in lieu of the broad pennant now worn by flag-officers in command of squad-rons, they shall wear a plain blue flag, of dimensions proportionate to the different classes of vessels prescribed for the jack. . . . Captain is over twenty years shall wear it at the forst all others at the mixzen." In effect, although not otherwise, this order introduced the grades or flags of the vice and Rear-Admiral, while the officers themselves, remained merely captains, but for the modest additional allowance of ca-bin furniture. Their flags were mistakenly saluted by foreigners as those of vice and rear-admirals, instead of as only brevet Com-

Next, in 1859, Secretary Toucey, who seems to have taken a pretty lively interest in such naval details, ordered that "Captains in command of navy-yards, who by order of the department have commanded a squadron, will be allowed to wear the flag authorized by the general order of May 18, 1858, on the re ing-ship attached to the station. Should receiving-ship attached to the station, then at any suitable place in the yard under the command. The senior flag-officer of the many will wear his flag at the main." All this time we had had Commodores in mame and by departmental regulation, but no

such rank existed legally prior to the act of 1862, which also provided for nine Rear-Adn rais, to be selected because of their profes-cional skill and gallantry. That act pre-scribed "that the three senior Rear-Admirals shall wear a square flag at the mainmast head; the next three, at the fore-topmast head, and all others at the mizsen." Farragut, by virtue of this law, was com-

missioned the senior Rear-Admiral, and hoisted the plain square blue flag at the main of the Hartford, and it is memorable that that was the first occasion on which an Admiral's flag was legally hoisted at he main. The plan, however, of hoisting Rear-Admiral's flag at the main, instead of at the mizzen, where the custom of other navel Powers had placed it long years before, became unpopular; and, at the in-stance of Richard H. Dana, then in Congress, the carriage of the fing was made uniform and agreeable to custom, without regard to the Admiral's seniority. As a re-sult, Farragut lowered his fing from the main and raised it at the mizzen, where a Rear-Admiral's flag should fly. On his pro-motion to Vice-Admiral in 1884, he shifted his flag to the fore, and in 1886, when erested a full Admiral, again hoisted the

same plain blue flag at the main truck. In 1866, a distinctive flag-apart from its position on the ship-was ordered for him, and then, for the first time, appeared the four white stars in the centre, forming a dismond. The Vice Admits here liamond. The Vice-Admiral had three stars the Rear-Admiral two, while the Commo-dore's broad penant bore one—the central big one of days gone by when he had a whole constellation. Admiral Farragut first hoisted this new flag on the frigate Frank-

THE FLAG OF THE ADMIRAL | In. in June, of 1867, and it, was saluted with SHE FOUGHT THE INDIANS.

All went well until 1869, when the union jack, hoisted at the main, was declared the flag for the Secretary of the Navy, and, having taken the union out of the ensign, in a spirit of apparent sentimental economy. It was further ordered that the remaining atripes of "Old Glory" should do duty as symbols of flag rank. Accordingly, the Admiral's flag became a rectilinear affair of thirteen plain, borizontal stripes, atternate red and white, worn at the main. The Vice-Admiral carried it at the fore, while the Rear-Admiral glaried in the same thing at the miz-sen. Farragut bitterly opposed the change, and, in fact, never consented to it. All of his associations were wrapped up in what his four-starred flag represented, and when he died, the following year, it was his old

flag that was laid upon his bler, in response to his own request that his flag be buried In 1876, "for various reasons, involving past usages and services, and for the convenience of distinguishing the relative rank of officers of the same grade," the striped fing having made it impossible to establish seniority by the old custom of the blue, the red, or the white flag, the Secretary restored the blue, four-star flag of the Admiral, and so it continued till the death of the one inheritor of Farragut's official dignity.

The department has given Admiral Dewey the flag so dear to Farragut. The layman may find it hard to understand the pride and feeling of the flag-officer toward his mt of bunting, but it is semething toward which he has striven through all the years of his career, and once he has broken it to the breeze, in the fulness of supreme com-mand, it typifies the fulfilment of his fond-

## WALKING OVER THE BRIDGE.

## The Big Structure's Advantage as Place for Exercise or Rest.

"Only picked people walk this mile," the man on the bridge promenade remarked to the young woman he had in charge, "philosophical people who are able to overlook small matters for the sake of large ones, and who count the wear and tear of getting here as quite reasonable toll for the privilege. The folks with nerves ant to get on edge and of delicate physique are barred out. They can't stand the racket, and that leaves more room for those who came from preference. It's the most comfortable and secure walk to be had anywhere in New York. You can walk here as free from disturbance as in any country road, and as for the view, every other in town is limited and one-sided in comparison. Look down the harbor there, and at all these busy bonts heading up stream, and that regular world's fair of wharves and docks, with their foreign ships; then at the lumped mass of the city's roofs and domes and steeples. You see New York in full figure from there, not in bit-by-bit phases as in other walks.

"We regular bridge-walkers get to know each other," he went on, lifting his hat to an elderly couple who passed. "Now, that long married and settled pair of lovers I have seen out here every fine day since the warm weather first set in. They walk over and back each afternoon, but they don't go quite to the New York entrance. The woman told me once that she counted her bridge walk to make her sleep well at night, and that it did her more good than twice the amount of exercise taken just about home in the paved and bricked-in streets. Noise? Well, there's considerable noise here, of course; more sorts of squeakings and vibrations than on any bridge in the world; but you get used to it, and it makes semething to think by, just as deaf people find the clat-

ter of a train a better medium for hearing than normal quiet.
"I enjoy the bridge walk because it's so "I enjoy the bridge walk because it's so restful, and yet there's so much stir and bustle all about that you don't feel so lonely, 'said a young business woman to the girl walking with her. "You can let your skirts go with a free conscience here without feeling that they're getting ruined. There are no crossings to get over, and you can look about and take in the view without feeling every minute that you're going to run into somebody nute that you're going to run into somebody or something, or they into you. We've moved clear out to Bluffton now. It takes me a full forty minutes on the trolley, but I take time every day that is fine for this outing because it does me so much good. Some of the girls in the office walk over in the mornings, too blue stars. When apart on their separate commands, each carried the blue pennant of senfority. It was an unsual occurrence for three officers of flag rank so to meet, but a copy of the New York Gasetts, of 1831, says:

In May, and, so far, they're keeping close the new there are now the second that the second that there are now the second that the seco but they don't live so far. Two girls I know tally, only taking the car over when there'

a storm or very heavy rain."
"There are no shop windows to look into here, nor any street-fakirs and sidewalk shows, booths, and cake and candy people like on Broadway or the Bowery," said the other young woman; "but there's plenty going on of another sort to take up your attention, and it's as cool and breezy as on the

bridge takes good care of its promenaders. It provides free ice-water for them, and good, open, land-and-water sights and views, to be seen from a vantage-ground well railed in from the risk and hubbub of the car-tracked ravine below. It is always breezy by the big piers. No matter which way the sun strikes there is certain coolnes at one side or the other of the great pillars. Some of the most interesting loiterers on the bridge are the school-children, boys and girls, and the street-gamins, amusing them-selves with trying to locate the far-off city spots by the roofs that shoot up nearest to them, and airing their knowledge as to the water-craft plying up and down and passing under the bridge. "That big lazy-looking boat that the two

ugs is towing is a Spaniard," says a little teen-eyed observer as a merchant-ship is headed under the bridge.
"It ain't, it's from Brazil. I know it by
the parrot-green on the flag," a companion

"It's from Ecuador, and its got India-rubber and herbs and lvory in it," maintains the other. "I know the place it docks at and one of the men who works there." Then follows hot argument, only abandoned

under the bridge looms up to divert inte-You think a boat's mast ever hit this bridge?" comes the query.
"Yes, of course. They hit often going under," is the answer.
"Well, they don't. It's too high. It was

pitched high on purpose, so they wouldn't," and meagre knowledge is made to do duty for much theorising and speculation.

KICURSIONISTS OUT ALL NIGHT.

steamer Republic Blockniled by Fog in the Lower Bay.

About 250 passengers who boarded the steamboat Republic on Friday afternoon with the intention of going to Long Branch returned 7 o'clock, after spending the night on the boat which was anchored, most of the time, in a fog off the Highlands. When it became apparent that it would be dangerous to proceed further the boat was stopped and Purser Fred Alles of the Republic notified the passengers that possibly the fog would soon lift, in which event the Republic would proceed to her destination. Anchor was dropped and the passengers be gan to make the best of it. After waiting two or three hours they commenced to grumble and some of the women went into hysterics. The officers did all in their power for the comfort of the passengers. Supper was provided, after which the vaudeville performance was started and continued until 10 o'clock. It was then announced that the boat would have to remain at anchor all night. There were state

chairs, beaches and the cabin floors. The Republic started back for New York at an early hour vesterday morning, going very slowly as the bay was still thick with fog. The passengers were provided with breakfast and before the landing they passed a vote of thanks to Pursor Alles for his efforts in their behalf.

rooms for about 100 persons only and the rest

of the passengers had to spend the night on

SINGLE-HANDED A WOMAN HELD THE REDSKINS AT BAY.

A Story of the Peril of a Pioneer Family in Old Missouri—Feathers Utilized as One of Her Chief Monus of Successful Defence. From the St. Louis Republic.

On the southern slope of a hillside, about fiftyfive miles west from St Louis and midway be tween the Missouri and Mississippi rivers, is the ruin-and even that has almost disappeared-of a quaint, heavily built log structure, known in the early days of the white man's advance into Missouri as Fort Kennedy. This outpost of the westward march of civilization was the scene of a battle waged on one side by a party of maurading Indians, on the other by a woman, and the result of which was the woman's victory. It was the battle of a woman for her home and little ones, and for her own life, too. The fort was years after superseded by a substantial farm-house, the forest has given way to the axe, and what was once thick woodland is now divided into pasture and grain fields. A ratiroad runs across one corner of the farm, and in sight of the house has grown up a thriving Missouri town. The descendants of the woman who fought and won the battle still own, but do not live on, the farm.

It was autump and the Osages, the tribe of Indians that inhabited the territory at that time, were rowing about in bands hunting, the game season being at its zenith. The redmen were not friendly with the over increasing palefaces, and, in fact, looked on them as their inveterate enemies. The whites returned the senparties of Indians were frequent. At the time mentioned, maraudings and murders by the Indians had been more frequent than usual.

it was not strange, therefore that Mother konnedy, should get apprehensive as alse peered down tool, should feel apprehensive as alse peered down too the control of the co

aprang from the porthole to the fireplace, flint and steel in hand. There was a flash and flames and pungent amoke from the feathers rolled up the chimney.

How so of disgust and a quick clambering from chimney to roof told that the movement had been successful—the Indians who had started down the chimney retreated from the heat and stifting smoke. Mrs. Kennedy struck a light to the tallow dip, so that if the Indians broke into the fort she might escape into the darkness with her little ones, while the assailants were temporarily blinded by the light. She had just set the light on the table in the centre of the room when there came a battering at the door of the fort. The Indians in front of the place had taken advantage of the opportunity offered by the ruse of the reds on the roof to secure a large timber and clarge against the door in an attempt to batter it in. At the third blow the lower half of the plank in the centre of the door gave way, leaving an aperture large enough to permit a man crawling through. Mrs. kennedy sprang to one side of the door and stood with upraised are. A painted face appeared at the aperture, but as Mrs. Kennedy stood close to the wall and on one side and the children on the other, all keeping quiet, the little ones obeying every sign of their mother and, like young partidges, ready to run and hide at her signal, the warnor saw nothing. The painted face was thrust further into the opening and seeing nothing the Indian started boddy through the broken door.

Mrs. Kennedy compressed her lips until blood was forced from them, and when the Indian had got well within the room and was about to draw his tomahawk she brought down the axe with crushing force on his swall, then hastily pulled him aside while death quieted him. The Indiana, thinking that there was no danger, their comrade having uttered no sound, started another of their number through. But he caught sight of their number through. But he caught sight of the indians to the timber. A moment later there was assignal which Mrs.

## FISITORS AT THE AQUARIUM.

Great Numbers of Strangers Amoug Them at This Season. The visitors at the Aquarium, as is usua at this season, include now a great number of people from out of town. There is, if anything, a larger proportion of such visiors than ever before. On some days third or more of the attendance seems made third or more of the attendance seems made up of strangers. These visitors come from all parts of the country, some from as far away as the Pacific Coast. They are peo-

or passing through it to or from seashore or country resorts, and they take the oppor-tunity to visit the Aquarium. The attendance at the Aquarium continues to increase; in the first eight days of August last year the visitors numbered 42,-849; in the same period this year, 61,898.

ole visiting the city on pleasure or business

HOTEL-PIASZA JUDGMENT.

Reputation for Being Disagreeable Achieved by a Brown-Eyed Girl.

The brown-eyed girl lay in the hotel hammock, her hands clasped behind her head, and her book lying neglected beside

"Yes," she said. "I think I'll go down to the village and get a box of chocolates It's too hot to do any wheeling, the tide's out, so I can't go in bathing, and those mean boys have gone off fishing, so I can't row. Yes, I'll take a nice little walk down to the village."

So she slid gracefully out of the hammock and ran up to the hotel to get her purse. Of course, all the old ladies were out on the veranda in full force, and as the brown-eyed girl ran lightly up the

steps, one of the plumpest of the number remarked with a sigh: "My dear, how can you bear to exert yourself so on such a hot day! Where are

you going?" "Just down to the village," replied the brown-eyed girl with a smile, her hand on the door.

"Oh, how fortunate! Just as I came to the end of this skein of silk! Would you mind going into that little corner store and getting me another, and a package of envelopes? I should be so much obliged!"

"You dear thing," said a gushing elderly lady, "would it be too much trouble to get me four yards of brown silk as near like this as possible?"

"And that reminds me," said she of the eagle nose, "Mabel told me this morning that she needed a paper of pins, a package of hairpins, a box of note paper, three spools of white cotton, a paper of needlesand, let me see-oh, yes, a bottle of ink. Do you think you could remember them, or would it be too much? You know, it is right on your way, or I shouldn't ask you. I wouldn't put you to any trouble for the world, but it is so hot to walk down, "I'm afraid the young lady will have a

good many bundles to carry," broke in the lady in the black silk walst. "I really dislike to trouble her, but I am making this little dress for my dear little grand-daughter's birthday, and I need a card of whiteter's birthday, and I need a card of whitepearl buttons. Please be sure they are
white, for I couldn't use the cream ones."
"Dear me," remarked the plump old lady,
"I really forgot the most important thing
I need—a bottle of witch-hazel, the large
size. I think you can get it at Smith's, on
Main Street, and if not there, at Jones's. I
haven't the least idea where Jones's is,
but I heart Mrs. Sweetvelock tell her husbut I heard Mrs. Sweetvoice tell her hus-band to get everything there, and I really forgot to ask her where it is. Do you think you can remember all the things?" she ask-

ed, affectionately.

"Perhaps with the aid of pencil and paper and my own good memory, I may be able to remember half of them," replied the brown-eyed girl, as she took out her silver

azel," said the fat iady in alarm.
"And don't forget the silk—"

"Or the buttons.

"Or the notepaper." "Or the ink.

"Or the envelopes."

The brown-eyed girl walked calmly down "I'll try to oblige all," she said, and the chorus cried: "Se kind of you." the steps.

At the gateway she met a nurse girl. "Was you going to the village, miss?"
asked the nurse girl, with a deprecating

"Yes," replied the brown-eyed girl. "Oh, miss, would you be so kind as to git me a spool of black cotton, No. 50?" "Certainly," said the brown-eyed girl obligingly, as she added this last item to her

list.

A half hour before dinner the brown-syed girl returned. She was not alone. Behind her marched two bare-footed urchins. Each carried an armful of bundles, big and little, while on each freckled countenance was a broad grin. The old ladies stared. "What in the world have they got?" asked the fat lady in an awed voice.

the fat lady in an awed voice.

"Why, perhaps they're our bundles," said
the cagle-nosed lady.

The bundles were deposited on the steps,
and the brown-eyed girl, looking warm and tired, distributed them. "We are so much obliged," said the fat

lady.
"Yes, indeed," chorused the others.

"I hope it wasn't too much trouble," said the gushing lady.
"Oh, no," replied the brown-eyed girl with great sweetness. "I had a lovely little walk, and it was so cool and nice in the shops. By the by, Mrs. Plumpton, Jones's fan't here at all. It is about a mile away at Blankville, but i didn't mind going. It didn't hurt me at all, you know. The sun just gave me a headache and a pain in my eyes, and I found the post-office closed when I returned, so I couldn't post my letter. But it didn't matter. However, I think it would benefit you more than a course of training at a symnasium to try my little experiment. It tends so to reduce flesh." And with a sweet smile she left them. "I had no idea she was so disagreeable,"

HATCHET GOES WITH STATUE.

Act of a Vermont Captain at Gettys-burg to Be Preserved on a Monument. From the Boston Globs.

It is not always best to bury the hatchet especially if it is an historical one. It has just been decided that the statue of Capt. Stephen F. Brown, which is a part of the monument marking the spot where or the monutent marking the spot where the Thirteenth Vermont Infantry stood at Gettysburg, will show a hatchet. Capt. Stephen F. Brown was a prisoner at the time the battle of Gettysburg began, but he was released, and with a hatchet heroloally led his company until he wrested from rebel officer a sword and pistol.

The hatchet in the statue rests near the Captain's right foot. The presence of the hatchet in any position naturally suggests inquiry, and that is just why the Vermonters wanted it there. Every cemetery guide will know the story of Capt. Brown and his hatchet, visitors will tell it to their children, and it will become history.

and it will become history.

At the battle of Gettysburg the Thirteenth Vermont was a part of Gen. Stannard's Ver-mont command. The Second Vermont Brigade had been left on outpost duty in Vir-ginia until the third day after the Army of the Potemac had passed it in pursuit of Lee's troops into Maryland and Pennsylvania. Then the brigade got orders to proceed by forced marches to join the Army of the Po-tomac. The latter was also on a forced march, but in six days' time the Vermonters had overtaken the main body. Just before the first day's battle Capt. Brown's command came up to a well at which was an armed guard.

'You can't get water here," said the guard. "'Gainst orders."
"D—n your orders," eaid Capt. Brown, and then, with all the canteens of the men, and with only one man to help him, he thrust the guard aside and filled the canteens. His followed, and he was deprived of

The history-making battle began with The history-making battle began with Capt. Brown a prisoner. He begged for a chance to rejoin his company, and was allowed to go. He picked up a camp-hatchet and ran to the firing-line, rushed into the fray, and singling out a rebel officer fifty yards away, penetrated the rebel ranks, collared the officer, wresting from him his sword and pistol, after which he dropped his hatchet, while his men cheered him amid the storm of bullets and smoke. Such amid the storm of bullets and smoke. Such, in brief, was Capt. Brown's exploit.

"Kentucky Gazette" Burned Out. LEXINGTON, Ky., Aug. 19.-The Kentucky Gazette, founded by John Bradford more than

alf a century ago, was burned out here this morning. The paper has been edited for forty years by Howard Gratz, father of the St. Louis and Kansas City millionaire brokers of that name. The venerable editor was badly burned while trying to save his office books.

LEARNED PROFESSORS STUDYING THEIR RELATION.

Monopoly of the Seed-Each Variety of Mosquito Peddles Its Own Kind of Shakes-Johns Hopkins

From the Baltimore Sun. To prove that mosquitoes convey malaria is the delicate and painstaking task which a number of investigators have set themselves in the Johns Hopkins Hospital laboratories. The scientific investigator avoids experimentation upon human beings for various reasons. One of these reasons, as expressed by a doctor, is that such experiments are avoided, just as the practice of cooking with dynamite, for fear of imperfect control of the heat and energy. However, it has been found that birds 'chill" without emetion and are subject to a type of malarial fever closely resembling that in human beings, except that the germ is slightly different. Consequently birds are used as the objects of the mosquitoes

inoculation with germs of "shakes." A Frenchman in Algiers discovered the germ of malaria in the 80s. To this chillproducing miscroscopic object was given the name of pleamodium malaria. Subsequent study has been along the lines of the life history and characteristics of the germ Manson and Ross, English investigators in India, and Grassi, an Italian, advanced the theory of inoculation of the disease by insects, usually mosquitoes, as being the most abundant and widely spread pest. It is the work of these experimenters which is being followed up and confirmed in Baltimore by Drs. John B. MacCallum and Eugene L. Opie, at the Johns Hopkins Hospital.

"First catch your mosquito" is the precept of these investigators. This is accomplished by the doctors themselves. Armed with a lot of small glass test tubes and raw cotton for stoppers, they go down to the marshes of some river. Their only bait is human hide, each one exposing portion of his body which is easiest to see and reach with his right hand. When a mosquito gets his bill well settled into this tempting bait, a test tube is clapped over it and the surprised insect springs to the top of its crystal cage. The sportsman quickly places a bit of raw cotton in the open end of the tube, which holds the mosquito in its prison. Then the hunter is ready for another insect victim. Hundreds of the insects must be caught for a single experiment.

The other live part of the experimenters' outfit is a number of crows, which in this region have been found the most suitable birds for experimental purposes.

The mosquitoes will survive for several days in their glass cages, but the doctors do not tarry long before beginning their experiments. In the first place the mosquitoes must be inoculated with the malarial germs. These are supplied from the laboratory stock, for the mosquitoes are not generally furnished with the germs when caught. By feeding the germs are introduced into each mosquito's stomach Then commences the delicate part of the

experiment.

Every two hours, or thereabouts, a mosquito must be killed and its body prepared for microscopic examination. This search under the magnifying lenses discloses that the malarial germs are broken up in the the mainrial germs are broken up in the mosquito's stomach. Each part becomes impregnated in a little sac or tumor in the stomach wall. Within this sac minute bodies, lenticular or diamond-shape, are formed, and finally the sac bursts without the stomach, thus allowing the little bodies, which have the power of movement, to get into the circulation of the mosquito. Once in this condition they quickly find their way to the salivary glands of the mosquito, where they congregate. By this time the mosquito is ready for "business," and those of the insects which have not already given up their lives to the inquisitive eye of science may be used to inoculate the malarial germ into birds or animals.

into birds or animals.

During this intermediate process in the body of the mosquito, the doctors have learned that the malaria germ is one of three varieties, producing one of three distinct types of the disease. One form of germ, which splits up into from eighteen to germ, which splits up into from eighteen to thirty of the diamond-shaped bodies ma-tures every forty-eight hours and causes the every-other-day chill, or tertian variety, when introduced into the human circulation. Another form, splitting into fewer bodies, produces the chill one day and respite for wo, or the quartan variety of malaria

third form develops irregularly and produces a corresponding irregularity in the time of chills recurring.

a corresponding irregularity in the time of chills recurring.

Strangely enough, each variety of germ is bred by a distinct variety of mosquito. The tertian, or every-other-day chill, germ is found only in the mosquito known as the anopheles claviger, or "key bearer."

With his mosquitoes thus "loaded," as it were, with germs, the doctor is ready to begin his inoculation of the crows. When the mosquito uses its proboscis to suck the blood of its victim, it injects from its salivary glands a portion of the fluid which is impregnated with malarial germs. Of course, the germs get directly into the blood vessels, travelling from small capillaries to velns and arteries. The first object of attack of the little diamend-shaped bodies, bred in the mosquito, is the red blood corpuscles. Some of the tiny bodies force their way into the corpuscles, although, of course, many of the corpuscles successfully realst the attack. Many of the little bodies perish in the "struggle for existence."

Those of the little bodies which secure resting-place within the corpuscies quickly go about their subdivision method of propagation, and at the given time the increase number of diamond-shaped bodies are ready to burst forth from the corpuscle. This, oc-curring at stated intervals, according to the time of maturing of the particular variety of germ, causes a chill, as the thousan amination of the blood of an infected per-

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Large size . . at 10 cents. Medium size - at 5 cents. Small size . 2 for 5 cents. Also, a LARGE ASSORTMENT of Unique and

POTTERY AND PORCELAINS at very moderate prices.

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MOSQUITOES AND MALARIA. son determines exactly the variety of germ and the prediction can be accurately made as to the time of the next chill after a study of the stage of development of the

Some of the germs put forth flagella, or tails, which waggle about in the blood cur-rent of the victim and finally break off from the parent body. Then these tails propel themselves about in the blood stream until a full-grown parasite is met, when an en-deavor is made to hammer a way through its walls. When the flagella succeeds it is believed it is carrying out the act of fer-

believed it is carrying out the act of fer-tilisation.

Thus inoculated, the crow is considered a fit subject for another crop of mosquitoes, which may suck the maiarisi germs from their victim's blood and, after the intermediste process, he ready to inoculate other birds, as the investigation is carried on. One point has been settled conclusively, so the doctors say, and that is that the mosquito doctors say, and that is that the mosquito cannot directly inoculate malaria from an infected person or bird to another. Although the mosquite may have malarial germs in its stomach, it cannot transmit them until the process of reproduction has been gone through with, and the germs get into the salivary glands.

salivary glands.

Usually the birds are not injured by the inoculation and survive to serve the purposes of the doctors for further experimentations. The remaining mosquitoes are killed off without compunction or protest from anti-vivisectionists. Some experiment-ers have had their birds succumb to the severity of the disease thus introduced into

investigation of the transmission of malaria by mosquitoes was suggested by the following facts as set forth by Dr. William S. Thayer of Baltimore in a paper on ma-laria read before the Maryland Public Health Association: "Mosquitoes invariably exist in malarious

regions, and the malarial fevers are more prevalent at those periods when the quisces are most abundant; they are cially numerous in the regions about swamps and marshes, where the daugers of infection are greatest. In a mainrious dis-trict there is greater danger of infection at about sundown and at night, but sunset and night are periods at which mosquitoes are highly active. The dangers of infection are greater near the ground than in elevated positions, but mosquitoes are more numer-ous near the ground. The danger of in-

ous near the ground. The danger of in-fection is greater on quiet nights than in windy weather, but wind is particularly un-favorable to the mosquito. "Emin Pasha was go convinced that the bite of the mosquito played an important part in the etiology of malarial fever in Africa, that he always travelled with a mosquito net, and escaped the disease. Big-nami, further, has noted that in certain parts of italy workmen who live in conical buts. of Italy workmen who live in conical huts, with a hole at the top, through which the smoke of their little fire passes, are unusually free from the disease, while those about them may be almost universally affected. Of course, the presence of smoke is one of the surest protections against

mosquitoes.

"Koch, who last year devoted some months in Africa to the study of malaria, was strongly impressed with the probability of this hypothesis. He says:

The more I study this disease the more I incline toward the opinion that the lat-ter (transference of the infection by means of the mosquito) is the main, probably the only, method. Wherever one goes, he finds tropical malaria and the mosquito present together. On the coast (in East Africa) there are several places which are free from the disease. One of these is the island of Chole, which lies upon the southern extremity of the island of Mafia. This is the only place on the coast where I could sleep without a mosquito net. In the mountains malaria stops at exactly that point where no mosquitoes are to be found. Inland malaria diminishes together with the mosquitoes. At those times of the year when there are many mosquitoes malari s more severa.

is more severe."

"The natives of Usambara Mountain often acquire the disease when they descend to the lowlands. They believe it to be due to the bites of the mosquitoes, and call the disease by the same name which they give to the mosquito—'nbu."

Fortunately, it is believed that malaria the control disease transmitted by live

is the only disease transmitted by live mosquitoes. Filaria sanguinis hominis, a hemorrhagic disease, is communicated by dead mosquitoes that impregnate water with the germs, which are fatal to them-

breed.
Study of the carrying of malarial infec-tion by mosquitoes has led to the conclu-sion that in this way alone is malaria communicated to human beings. It is said that demonstrations have proved con-clusively that malaria cannot be acquired by drinking impure water or by inhalation. Only one way remains then, it is said, for the germ to get beneath the skin of a human being, and that is by an insect's bite. As the meaquito is the most com-mon insect in malarious regions, at its door is laid the charge of infecting human eings by its bite.

TEMPERATURES IN DEEP MINES. Some Interesting Data Covering Depth of Nearly a Mile.

From the Chicago Inter-Orean. ISHPEMING, Mich., Aug. 5.-George Newett of this city, who recently retired rom the office of Commissioner of Mineral Statistics of Michigan, which he ably filled for two terms, has, after an exhaustive investigation of the subject, replied to the extensively published statement relative to the hot copper mines of Michigan. The article referred to stated that at a depth of 6,500 feet in the Calumet and Hecla mines it is so hot that the miners can work only for a few moments at a time without becoming wholly exhausted, the temperature being constantly 100 degrees Fabrenheit.

In his very interesting statement ex-Com nissioner Newett says that the greatest depth of the Calumet and Hecla is not within 1,500 feet of that named. The deepest shaft in the world is the Red Jacket shaft of this mine. It is vertical and is 124x254 inside of the timbers. Its location is at the northern end of the mine, directly in front of shaft No. 4, which is inclined and has followed the belt of the copper-bearing conglomerate downward from the surface. The Calumet conglomerate was encountered by the verti cal shaft at a depth of 3,285 feet below the surface, this corresponding with the fiftysixth level of the mine, and has been carried downward past that point to a total depth of 4,900 feet. This will be the bottom of this opening for the reason that from its lowest point the company can secure all the or

in this end of its property. The investigation showed that in sinking this shaft the atmosphere grew warmer after the lode was passed through. There was no ventilation except that artificially supplied by the air compressor, but this was satisfactory. At that time, as ever since, it has been lack of ventilation that made the temperature in the lower workings uncomfortable at times. The big shaft is now connected with No. 4 at several levels, the connections being made at every third level, the levels being sixty feet spart.

At the bottom of the shaft the temperature is \$5 degrees. The increase per 100 feet is very small, but in order to determine exactly what this increase is, a careful test of the temperature of the rock has been under way for the past year. In order to make this test-holes have been drilled in the wall rock In these slow-registering thermometers have been placed, and the holes plugged up. In a month from the time of sealing the holes are opened and the temperature taken and recorded. This plan has been followed from the surface to the bottom of the shaft, it being the purpose of the company to make a thorough and trustworthy test, so that it may be applied to the future working of the property at greater depths than ever yet attained. It is desired to ascertain correctly the temperature of the different elevations as well as of the rock strata.

The circulation of air in the mine grows

ROBERT DOWNING

Tells the Secret of His Great Endurance.



ROBERT DOWNING, the Tragedian

Robert Downing was recently interviewed by the press on the subject of his splendid health. Mr. Downing promptly and em-phatically gave the whole credit of his splendid physical condition to Pe-ru-na, saying:
I find it a preventive against all sudden summer ills that swoop upon one in chang-

ing climates and water.

It is the finest travelling companion and safeguard against malarial influences.

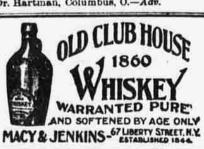
To sum it up, Peru-na has done me more good than any tonic I have ever

Healthy mucous membranes protect the body against the heat of summer and the cold of winter. Pe-ru-na is sure to bring health to the mucous membranes of the

health to the mucous membranes of the whole body.

Write for a copy of Dr. Hartman's latest book entitled "Summer Catarrh." Address Dr. Hartman, Columbus, O.

Remember that cholera morbus, cholera infantum, summer complaint, bilious colic diarrhœa and dysentery are each and all catarrh of the bowels. Catarrh is the only correct name for these affections. Pe-ru-na is an absolute specific for these aliments, which are so common in summer. Dr. Hartman, in a practice of over forty years, never lost a single case of cholera infantum, dysentery, diarrhœa, or cholera morbus, and his only remedy was Pe-ru-na. Those desiring further particulars should send for a free copy of "Summer Catarrh." Address Dr. Hartman, Columbus, O.—Adv. Dr. Hartman, Columbus, O.-Adv.



steadily better as the levels are connected steadily better as the levels are connected with the workings by crosscuts. This mine has twelve shafts upon its conglomerate, and all are connected at many levels. In the upper portion of the mine, where the rock which holds the copper has been mined and sent to the surface, the opening at the end of the shaft is walled up. This is found to greatly improve the ven-tilation, the circulation of the air being more free and rapid than if the old open-ings were not shut off from the shafts. In this line of openings some of the shafts are downcasts, drawing the air downward from the surface, while the others are up-casts, through which the air rises from the mine to the surface. This works satisfactorily, except at a short time during the warmest portions of the summer, when the draft into and out of the mine grows less

At one of the Tamarack mine shafts, where all the shafts are vertical, the tem-perature at the bottom, which is 4,500 feet below the surface, is 82 degrees. Here the atmospheric condition is improved because this shaft is being connected with another. Connections have been completed at the ninth and tenth levels, which are

at the ninth and tenth levels, which are above the copper-bearing conglomerate lode, and at the eleventh and twelfth levels, which are below the lode.

It is claimed that in no other place in the world where mining is carried on to a depth exceeding 2,000 feet is the temperature of the rocks so low as at the mines in the Michigan copper district. It is asserted that at the Compton with the temperature of the rocks as the mines in the world with the compton which we have the compton which the compton which the compton which we have the compton which we have the compton which we will be compared to the compton will be compared to the compton which we will be serted that at the Comstock mine the temfeet, and that the mines of the old world grow hot very rapidly after 1,000 feet has been reached. It is believed to be certain that Lake Superior, under which the rocks of the Calumet conglomerate dip, and the water of which is only a few degrees above freezing in the summer, absorbs the heat

of the rocks.

Mr. Newett says he has read that some of the South African mines are equipped with the intention of going down 7,000 feet, but he has no knowledge on the subject. He thinks the temperature must be much higher than in the mines of the upper peninsula of Michigan, as there is nothing to take up the heat of the rocks. That the Calumet and Hecla and the Tamarack mines can be worked at a far greater depth than they have yet attained is asserted to be certain, but just what the increase of heat will be after passing 5,000 feet is proheat will be after passing 5,000 feet is pro-blematical. The experiment now under way at the Calumet and Hecla, the result of which will be made public in a short time, is expected to definitely settle this ques-

tion.

The effect upon the miners of existing atmospheric conditions has been greatly exaggerated. Mr. Newett asserts that he has conversed with many men who regular-y work at the bottom of the lowest shaft or ten hours each day, and that they are fully as strong and rugged as their brethren

Tow Mills in a Trust.

DES MOTNES, Ia., Aug. 19.-Pitteen tow mittle have formed a combination by which they expect to control the tow market of the country. Headquarters have been established at Elma, on the Great Western, where a large factory is in operation, and where A. G. Brown, whe engineered the deal, has been placed in charge of the interests of the new concern. It is said that practically all tow used in the country is manufactured in these fifteen mills, which are in Northern Iowa, Southern Minnesota and the

FOUR POUNDS OF FLESH, From One Pound of Food.

The statement is made that one pound of Grape-Nuts will supply more nourishmens (that the system will absorb), than 10 lbs. of meat, wheat, or oats.

A man protested that the claim was extravagant, but upon trial it was found that by leaving off meat altogether at breakfast and lunch, and taking in its place 4 heaping teaspoons of Grape-Nuts, began to gain flesh and strength, and before the full pound package was gone, had gained 4 lbs. in weight, whereas he had been losing on

his meat diet. How could be gain 4 lbs. and only eat \$ Ib. Grape-Nuts? Remember, the 4 terapoons of Grape-Nuts are but a portion of the meal, but they furnish the predigested and easily assimilated part and help digest other foods assisting nature in building in water (75 per cent. of all flesh). In other words, Grape-Nuts furnish the workers or the active elements of food in the most perfect

condition for nature to make use of Grocers furnish Grape-Nuts at 15 cents per package.

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